Higher Education Effects in Job and Marital Satisfaction: Theory and Evidence*

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Abstract

This paper examines how educational decisions affect job and marital satisfaction. We build up a model with educational assortative matching where individuals decide whether to attend university both for obtaining job satisfaction and for increasing the probability to be matched with an educated partner. The educational choices between future partners are simultaneously determined as a Nash equilibrium. The theoretical results suggest that, as assortative matching increases, the proportion of educated individuals increases. For educated individuals, job satisfaction falls and marital satisfaction increases. We test our model using the British Household Panel Survey. We carry out longitudinal analysis for years 2003-2006. Our empirical findings support the theoretical results.

[Very Preliminary]

JEL Numbers: C78, I21, J12

Keywords: education, marriage, job satisfaction, educational assortative matching.

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1 Introduction

This paper examines how educational decisions influence job and marital satisfaction. We build up a theoretical model to highlight the relationship between higher education, marriage market, job and marital satisfaction, and then we test the model empirically.

In the traditional approaches, education aims to increase income in the working period (Becker, 1964) or to signal unobserved ability in the job market (Spence, 1973). Our idea is that individuals mainly study for two reasons. First, they obtain several advantages in the job life through education: a better kind of job, a better salary, more bargaining power in the job market, and so on. All these advantages are expressed by a greater job satisfaction. Second, individuals increase the chances of marrying an educated partner, as the educational levels of partners are strongly interrelated.

Why do partners tend to have similar educational levels? This may be explained by lifestyle choices: similar-educated partners are more likely to share professional duties, past time activities and view of life. Also, the “fertility intentions” are similar between partners with similarities in education. Educated individuals prefer to delay conception relative to the general population and hence pick individuals who have similar tendencies or intentions (Cochrane, 1979). In contrast, large differences in the partners’ educational level have negative effects on experienced life satisfaction (Frey and Slutzer, 2006). We refer to the similarity in partner’s educational levels as “educational assortative matching” \(1\). Past research has shown strong evidence of increases in the educational resemblance of spouses since at least the 1940s in United States (Kalmijn 1991a, 1991b; Mare 1991; Pencavel 1998; Qian and Preston 1993; Smits et al. 2000, Schwartz and Mare, 2005).

We examine a population of men and women who differ in effort of studying and decide whether to attend university or not. To attend university gives job satisfaction in the working life, which can be positive or negative according to the effort required for studying.

Men and women then are matched in the marriage market. We assume that educated partners provide individuals with positive marital satisfaction: in

\(^{1}\)The expression “assortative matching” has been coined by Gary Becker (1973), and it alludes to a relationship (either positive or negative) between characteristics of partners. As we refer to the similarity in level of education between partners, we specify that assortative matching is “educational”.

2
fact, educated partners generally have a better income to share, better working timetable, or a general life satisfaction. The consequence of this assumption is that individuals prefer to marry a partner who attended university.

A crucial assumption of the paper is the marriage matching mechanism. The matching can be random or assortative. In the case of random matching, there is no relationship between the educational levels of partners; in the case of assortative matching, the educational levels of partners are the same. The probability of assortative matching is exogenous and determined by customs, social attitudes and culture of the population considered.

The theoretical results show that, as the probability of assortative matching increases, men and women want to increase the probability to marry an educated partner, and so university attendance increases. This makes diminish both marginal job satisfaction: in fact, as the proportion of educated individuals increases, the marginal educated individual is less talented and needs more effort of studying. In turn this leads the average job satisfaction to decrease, as the value of education becomes diluted and thus there are less job opportunities for educated individuals. On the other side, the expected marital satisfaction increases the higher the probability of assortative matching, which explains why some individual attends university even if their job satisfaction will be negative in the working life.

To test the theoretical model, we use the British Household Panel Survey (BHPS) and we consider a subsample of couples from years 2003-2006. The analysis is carried out firstly for the full sample and then separately for male and female individuals, in order to investigate both the validity of our theoretical assumptions and the differences in educational decisions according to gender. To verify the existence of educational assortative matching, we check for a positive relationship in the level of education between partners. Then, we test for a relationship between job satisfaction and the probability to attend university. Finally, we examine the relationship between marital satisfaction and the partner’s education, to control whether in the presence of educational assortative matching, individuals obtain a higher marital satisfaction from an educated partner. As control variables we use sex, age, regions and professions.

The descriptive analysis shows that the proportion of women who attend university is slightly lower than the proportion of men. Also, women’s job satisfaction is systematically higher than men’s satisfaction, while the marital satisfaction is slightly higher for men than for women. On the other hand, men obtain in average higher marital satisfaction than women. The analysis
of assortative matching confirms that the educational assortative matching assumption is consistent with the evidence considered. In the job satisfaction analysis, we find a negative relationship between job satisfaction and having a university degree. In the marital satisfaction analysis, we find a positive relationship between marital satisfaction and the partner’s higher education. These findings are consistent with the theoretical results, by which an increase in the probability of educational assortative matching diminishes job satisfaction and increases marital satisfaction for educated individuals.

This paper is related to three different branches of the literature, namely the literature on pre-marital investments, the literature on job satisfaction and the literature on marital satisfaction. In the former, pre-marital investments in human capital influence the kind of matching in the marriage market, the decision power inside the family or the presence of assortative matching. Peters and Siow (2001) study a model with assortative matching by family wealth. Benevolent parents invest in their children’s education in order to increase their probability to be matched with a wealthier partner. Their results show that, in large marriage markets, any pair of families whose children are matched will make efficient investments. The reason is that assortative matching forces each family to compensate the investment in human capital of the other indirectly through the investment that it makes in its own child. Iyigun and Walsh (2007) investigate how pre-marital investment affects the household bargaining power. They show that, for each couple, an endogenously determined intra-household sharing rule emerges as the only maritally sustainable outcome. Both the distribution of spousal pre-marital endowments and the sex ratios in the marriage markets help to determine the sharing rule. Chiappori et al. (2006) assume education to be linked to a return in wage and to an increase in the extraction of intra-marital share. Assortative matching is endogenously determined according to the differences in wage and household roles across genders. When these are gender neutral, men and women educate in equal proportions and there is pure positive assortative matching in the marriage market. But if these are different for men and women, some educated individuals can marry uneducated spouses and those who educate less extract a relatively larger share of the marital satisfaction. Following this strand, we assume that a link exists between education, marriage and assortative matching.  

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2In contrast with the view of the family as a single decision unit, they assume efficient intra-household allocations and individual members of the family are decision-makers through a bargaining process. See, for example, Becker (1991) and Chiappori (1988, 1992).
With respect to these contributes, our focus is how decisions on higher education affect, through educational assortative matching, the marriage outcome.

The paper is also related to the job satisfaction literature. Previous studies in Britain analysed job satisfaction related to training (Jones et al., 2009), temporary jobs (Booth, Francesconii, Frank, 2002), unionisations (Bryson, Cappellari, Lucifora, 2004) and work environment (Gazioglu and Tansel, 2006). This paper is particularly related to the literature that investigates relationships between job satisfaction and education. Meng (1990) finds that education increases workers’ freedom to decide how to do the work, workers’ influence on the decisions of supervisors, and their content with the physical environment of the job. Idson (1990) reports no significant effects of education level. Clark (1996) reports that individuals with longer schooling have comparative lower levels of job satisfaction, as do men, middle-aged people, those working longer hours, and employees in larger establishments. Clark and Oswald (1996) find that overall job satisfaction is declining in the level of education when income is held constant, and that satisfaction depends inversely on workers’ comparison wage rates. Most recently, Florit and Vila-Lladosa (2007) show that the effects of education on job satisfaction are mainly indirect effects transmitted though the influence of schooling on workers’ health status, wages and other observable job characteristics. Despite this large empirical evidence on the relationship between job satisfaction and education, there have been no attempts to explain the reasons behind it. Our potential contribution to this literature is to propose a theoretical framework to interpret the empirical results. Another potential contribution is that we perform a longitudinal analysis, unlike the previous studies which were focused on cross-sectional analysis.

Finally, the paper is related to the marital satisfaction literature. Here the levels of education between partners are usually considered as control variables (e.g., Rogers and May, Glenn, 1990; White and Rogers, 2000). There is a number of studies suggesting that the quality of marital relationships is positively associated with premarital education both of the individual and the partner (some examples are Stanley et al., 2006, Hahlweg and Markman, 1988, Halford, Markman, Kline, and Stanley, 2003, Sayers, Kohn, and Heavey, 1998 Silliman, Stanley, Coffin, Markman, and Jordan, 2001). This paper can contribute to this literature by providing both further evidence to the positive relationship between marital satisfaction and the partner’s level of education and a possible explanation to it.

The paper is organised as follows. The theoretical model is developed in
Section 2; the analysis of equilibrium is illustrated in Section 3; Section 4 describes the data and the variables used; the empirical model is presented in Section 5; our results are summarised in Section 6, and concluding remarks are in the last section.

2 Theoretical model

We study an economy with two populations, equally large, one of men and one of women. The members of each population differ in effort, labeled $a_i \in [0, 1], i = m$ (men), $w$ (women), respectively, and distributed with density $f(a_i)$ and c.d.f. $F(a_i)$. We consider a single generation in two periods.

In the first period, men and women decide whether to attend university or to work immediately. We refer to individuals who acquired higher education as “educated” individuals. In the job market, educated individuals will receive an educational benefit $y_i > 0$. This can be seen as an better salary as well as an improvement in work conditions, the quality of job, or more flexibility. We assume that the men’s educational benefit is higher than the women’s one, $y_m > y_w$. This hypothesis reflects the empirical evidence that, ceteris paribus, women generally face worse job conditions than men. The individuals who decide to attend university have a total cost of education $ca_i$, where $c > 0$. The lower the effort, the more the individual’s ability and the less the cost of studying. We define job satisfaction as the educational benefit net to the effort of studying, that is the difference between $y_i$ and $ca_i$. If a person decides whether to go to the job market straight away, he receives zero job satisfaction. Note that, in the case that the effort of studying is high, job satisfaction can be negative for an educated person.

The proportions of educated men and women are $\sigma_m \in [0, 1]$ and $\sigma_w \in [0, 1]$, respectively. According to the general evidence, we assume that the proportion of educated men is higher than the proportion of educated women, i.e., $\sigma_m > \sigma_w$.

In the second period, people are matched with one of the opposite sex. The matching leads individuals into a marriage. We assume that to marry an educated partner gives a marital satisfaction $b > 0$. This occurs since a graduate job reflects good work conditions, like a better salary, flexible hours, and so on. The partner of an educated individual indirectly benefits from all these aspects.

Given the benefits and costs for attending university and the marital sat-
isfaction, the payoff matrix is the following:

<table>
<thead>
<tr>
<th></th>
<th>educated</th>
<th>not educated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>man</strong></td>
<td><strong>woman</strong></td>
<td></td>
</tr>
<tr>
<td>educated</td>
<td>$y_m - ca_m + b, y_w - ca_w + b$</td>
<td>$y_m - ca_m, b$</td>
</tr>
<tr>
<td>not educated</td>
<td>$b, y_w - ca_w$</td>
<td>$0, 0$</td>
</tr>
</tbody>
</table>

The expected payoff of individuals depends on the matching in the marriage market. The matching can be random or assortative. In the case of random matching, the partners’ levels of education are not related. This happens when individuals meet their own partners by chance. Hence the probability for a man to marry an educated woman is $\sigma_w$ (i.e., the probability that a woman is educated) and the probability for a woman to marry an educated man is $\sigma_m$ (i.e., the probability that a man is educated), regardless of the individuals’ level of education.

We denote the probability of assortative matching\(^3\) as $\beta \in [0, 1]$. Assortative matching occurs when individuals meet their partners from university: in this case we assume that individuals marry a partner with same level of education with probability one. This happens generally when every member of each group can find a counterpart in the other group with the same level of education. In this specific context educated women marry only educated men, since there are few educated women and so every educated woman can find a educated counterpart. For the same reason, some educated man will be matched with an educated woman, and some not.

The following table shows the matching mechanism:

<table>
<thead>
<tr>
<th>Men’s matchings</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>edu man + edu woman</td>
<td>$(1 - \beta)\sigma_w + \beta\frac{\sigma_w}{\sigma_m}$</td>
</tr>
<tr>
<td>edu man + unedu woman</td>
<td>$1 - (1 - \beta)\sigma_w + \beta\frac{\sigma_w}{\sigma_m}$</td>
</tr>
<tr>
<td>unedu man + edu woman</td>
<td>$(1 - \beta)\sigma_w$</td>
</tr>
<tr>
<td>unedu man + unedu woman</td>
<td>$1 - [(1 - \beta)\sigma_w]$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Women’s matchings</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>edu woman + edu man</td>
<td>$(1 - \beta)\sigma_m + \beta$</td>
</tr>
<tr>
<td>edu woman + unedu man</td>
<td>$1 - [(1 - \beta)\sigma_m + \beta]$</td>
</tr>
<tr>
<td>unedu woman + edu man</td>
<td>$(1 - \beta)\sigma_m + \beta\left(\frac{\sigma_m - \sigma_w}{1 - \sigma_w}\right)$</td>
</tr>
<tr>
<td>unedu woman + unedu man</td>
<td>$1 - (1 - \beta)\sigma_m + \beta\left(\frac{\sigma_m - \sigma_w}{1 - \sigma_w}\right)$</td>
</tr>
</tbody>
</table>

\(^3\)In order to simplify the terminology, from now on we refer to “assortative matching” meaning “educational assortative matching”.

In the case of random matching \((1 - \beta)\), educated and uneducated men marry an educated woman with probability \(\sigma_w\), while educated and uneducated women marry an educated man with probability \(\sigma_m\). In the case of assortative matching, since there are less educated women than men, educated men marry an educated woman with probability \(\frac{\sigma_w}{\sigma_m}\) (that is the probability that a woman is educated over the probability that a man is educated) and every educated woman finds an educated partner. On the other hand, none of uneducated men marries an educated woman, while some of uneducated women (with probability given by the difference between educated men and women over the set of uneducated women) will marry an educated man.

The equilibrium of the interaction in educational choices between men and women is defined as the pair of efforts \((a^*_w, a^*_m)\) where individuals are indifferent between studying or not studying. The value of \(a^*_i\) increases as the educated persons in the population increase, since the persons who decide to study are those whose effort is below \(a^*_i\). As a consequence, the probability to have that level of \(a_i\) is equal to the probability to be educated. Therefore, \(\sigma_w = F(a^*_w)\) and \(\sigma_m = F(a^*_m)\). Moreover, we assume \(F = a_i\), thus we can rewrite the equilibria solutions like \(\sigma_w = a^*_w\) and \(\sigma_m = a^*_m\). Following that \(\sigma_m > \sigma_w\), necessarily the effort in equilibrium for men \((a^*_m)\) needs to be greater than the effort in equilibrium for women \((a^*_w)\): in other words, a woman who is indifferent between studying or not is abler than a man who is indifferent between studying or not.

Given the payoff matrix, the matching mechanism and the assumptions on the distribution of effort, men and women decide to study if their expected payoff of studying is higher than the expected payoff not to study. This is shown by the following threshold lemma.

**Lemma 1** A man attends university if and only if:

\[
\left((1 - \beta)a_w + \beta \frac{a_w}{a_m}\right) (y_m + b) + \\
\left(1 - \left((1 - \beta)a_w + \beta \frac{a_w}{a_m}\right)\right) y_m - ca_m \\
\geq (1 - \beta)a_w b,
\]

while a woman attends university if and only if:

\[
\left((1 - \beta)a_m + \beta (y_w + b) + \\
n
\]
Proof. Given the matching mechanism, the expected payoffs for men are:

\[
EII(\text{ed:man}) = (1 - (1 - \beta)a_m + \beta) \left( y_m + b \right) + \\
\left( 1 - (1 - \beta)a_m + \beta \left( \frac{a_m - a_w}{a_m} \right) \right) y_m - ca_m,
\]

and

\[
EII(\text{uned:man}) = (1 - \beta)a_w b,
\]

respectively, where the first part of both equations represents the payoff in the case of the matching with an educated woman and the second part of the first equation represents the matching with an uneducated woman. The expected payoffs for women are:

\[
EII(\text{ed:woman}) = ((1 - \beta)a_m + \beta) \left( y_w + b \right) + \\
(1 - ((1 - \beta)a_m + \beta)) y_w - ca_w,
\]

and

\[
EII(\text{uned:woman}) = \left( 1 - \beta \right) a_m + \beta \left( \frac{a_m - a_w}{1 - a_w} \right) b,
\]

respectively, where first part of both equations represents the payoff in the case of the matching with an educated man and the second part of the first equation represents the matching with an uneducated man. Men and women will prefer to study until the expected payoff of attending university is higher than expected payoff of going to work at once, that is until:

\[
EII(\text{ed:man}) \geq EII(\text{uned:man}),
\]

and

\[
EII(\text{ed:woman}) \geq EII(\text{uned:woman}),
\]

which gives the Lemma. ■

The following proposition shows the equilibrium in educational choices.
Proposition 1 An equilibrium in educational choices exists and it is given by the pair \((a_m^*, a_w^*)\) which is solution of the system:

\[
a_m^* = \frac{1}{b\beta} \left( y_w + b\beta - ca_w - a_w y_w + ca_w^2 \right),
\]

\[
a_w^* = \frac{1}{b\beta} \left( ca_m^2 - a_m y_m \right).
\]

3 Analysis of equilibrium

We are interested in checking how the existence of assortative matching affects the decisions of having higher education. To do that, we study the comparative static through a computational example. We examine how the increase in assortative matching may affect job satisfaction and marital satisfaction of men and women. However, note that this example do not claim utmost realism, and we do not calibrate and fine-tune the model in order to achieve an optimal fit with real world data.

We assign \(y_m = 0.2, y_w = 0.15\), and the rate cost of education\(^4\) \(c = 1\). The intensity of assortative matching varies from 0.1 to 0.9. We consider the effect of the presence of assortative matching on marginal and average job satisfaction and on expected marital satisfaction. The marginal job satisfaction is the job satisfaction of the educated individual who is indifferent between studying or not: \(y_m - ca_m^*\) for men and \(y_w - ca_w^*\) for women. The average job satisfaction is obtained by assuming a uniform distribution. Hence the average job satisfaction \((ajs)\) is: \(ajs_m = \frac{y_m - ca_m^* + y_m - ca_m^*}{2}\) and \(ajs_w = \frac{y_w - ca_w^* + y_w - ca_w^*}{2}\).

Since \(\bar{a}_m, \bar{a}_w = 0\), then \(ajs_m = \frac{2y_m - ca_m^*}{2}\) and \(ajs_w = \frac{2y_w - ca_w^*}{2}\). Then we take into account the variation in the expected marital satisfaction. The expected marital satisfaction depends on the probability of an educated individual to marry an educated partner. According to Lemma 1, this is \(E(b)_m = (1 - \beta)a_m^* + \beta \frac{a_m^*}{a_m} b\) for educated men and \(E(b)_w = ((1 - \beta) a_m^* + \beta) b\) for educated women.

Table 1 illustrates the results. As assortative matching increases, both marginal and average job satisfaction diminish for both men and women. Moreover, while marginal job satisfaction is always negative, average satisfaction becomes negative for high probabilities of assortative matching. On the other

\(^4\)Note that \(c\) is always higher than \(y_m\) and \(y_w\). This occurs to let \(y_m - ca_m\) and \(y_w - ca_w\) to be negative. In fact, in the case where \(c\) is lower than \(y_m\) or \(y_w\), job satisfaction would be always positive, since the value of \(a_m\) and \(a_w\) is at most 1.
side, the expected marital satisfaction increases the higher the probability of assortative matching.

<table>
<thead>
<tr>
<th>β</th>
<th>0.1</th>
<th>0.3</th>
<th>0.5</th>
<th>0.7</th>
<th>0.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \beta )</td>
<td>am</td>
<td>0.232</td>
<td>0.304</td>
<td>0.378</td>
<td>0.453</td>
</tr>
<tr>
<td>( \beta )</td>
<td>aw</td>
<td>0.188</td>
<td>0.263</td>
<td>0.338</td>
<td>0.409</td>
</tr>
<tr>
<td>( \beta )</td>
<td>men</td>
<td>-0.032</td>
<td>-0.104</td>
<td>-0.178</td>
<td>-0.253</td>
</tr>
<tr>
<td>( \beta )</td>
<td>women</td>
<td>-0.038</td>
<td>-0.113</td>
<td>-0.188</td>
<td>-0.259</td>
</tr>
<tr>
<td>( \beta )</td>
<td>men</td>
<td>0.06</td>
<td>0.05</td>
<td>0.01</td>
<td>-0.03</td>
</tr>
<tr>
<td>( \beta )</td>
<td>women</td>
<td>0.06</td>
<td>0.02</td>
<td>-0.02</td>
<td>-0.05</td>
</tr>
<tr>
<td>( \beta )</td>
<td>men</td>
<td>0.100</td>
<td>0.178</td>
<td>0.246</td>
<td>0.302</td>
</tr>
<tr>
<td>( \beta )</td>
<td>women</td>
<td>0.124</td>
<td>0.205</td>
<td>0.276</td>
<td>0.334</td>
</tr>
</tbody>
</table>

The reasons of these results may be explained in the following way. As assortative matching increases, the probability of marrying a partner with the same level of education increases. Educated persons are favourites as partners since they give marital satisfaction. Hence individuals have an incentive to study not only for obtaining job satisfaction, but also for increasing the probability to marry an educated partner. As a consequence, it may happen that an individual decide to attend university even if the effort of studying makes his or her job satisfaction to be negative. In fact the negative job satisfaction can be offset by the increased probability of marrying an educated partner, which provides marital satisfaction.

4 The data

The dataset used in our analysis is the British Household Panel Survey (BHPS). This is a nationally representative random sample survey of households in Britain, which began in 1991 and since then it follows the same representative sample of individuals. The BHPS was designed as an annual survey of each adult (16+) member of a sample of more than 5,000 households, making a total of approximately 10,000 individual interviews. The same individuals are interviewed in successive waves and, if they split-off from original households, all adult members of their new households will also be interviewed. The main objective of the survey is to promote the understanding of social and economic change at the individual and household level in Britain, to identify, model and
forecast such changes, their causes and consequences in relation to a range of socioeconomic variables.

Unlike the previous job satisfaction literature, which focuses on cross-sectional analysis\(^5\), we used a panel technique to analyse its determinants. We consider a four-years sample for 2003-2006, which includes 10812 individuals. Our analysis is based on the sub-sample of men and women aged between 23 and 65 years who provided complete information at the interview dates, who are in a relationship and live in the same household. A relationship where a man and a woman live together is a proxy of the marriage in the structural model. These restrictions have two effects. First, they guarantee that the individuals in the sample considered are at a working age. In fact, we can identify the relationship between educational decisions, marriage and job satisfaction only for working-age individuals. Second, they allow us to highlight the relation between the educational choices of individuals in a couple.

### 4.1 Dependent variables

We consider higher education, job satisfaction and marital satisfaction as dependent variables. In fact, if there is strong probability of assortative matching, the individuals’ education needs to be positively related to their partners’ education. Also, the theoretical results indicates that a high probability of assortative matching has two effects. First, job satisfaction diminishes as the level of education increases. Second, marital satisfaction increases as the partner’s level of education increases.

The first dependent variable is higher education. The BHPS asks individuals which educational degree they obtained. In order to reflect the equilibrium in the theoretical model where individuals decide whether to attend university or not, we construct a binary variable taking the value of the unity if individuals obtained every degree higher than college degree and zero otherwise.

The second dependent variable is job satisfaction. The BHPS asks to rate the satisfaction levels with four items: “pay”, “job security”, “kind of work” and “hours worked”. Each of these was to be given by the worker a number from 1 to 7, where 1 corresponded to “not satisfied at all”, 7 corresponded to

“completely satisfied”. Individuals were then asked a final question, after they had rated their levels of contentment with the list of topics, worded as: “All things considered, how satisfied or dissatisfied are you with your present job overall using the same 1-7 scale?” The way the question was asked suggests that individuals’ replies weigh up many attributes of the job package. Hence the data may approximate total well-being from work rather better than can a narrow question about job satisfaction. Also, in this choice we follow Clark and Oswald (1996).

The third dependent variable is marital satisfaction. The BHPS ask individuals the following question: “How dissatisfied or satisfied are you with your husband/wife/partner?” Respondents could answer on a scale from one (totally unsatisfied) and seven (very satisfied). For some values, like 1 or 2, we have an amount of answers which is lower than 1%. Hence we regroup it by creating a new variable: if marital satisfaction is 1, 2 or 3, we assign the value zero (“unisatisfied”), if marital satisfaction is 4, we assign the value one (“neutral”) and finally if it is 5, 6 or 7 we assign the value two (“satisfied”).

4.2 Explanatory variables

As explanatory variables, we consider first a number of control variables for every dependent variable, and then a specific explanatory variable for each dependent variable.

The control variables are sex, age, age squared, regions, and professions. The variable sex takes values of zero if the individual is a man and one if the individual is a woman. We use age and age square in order to examine the variation of the dependent variables according to age and the rate of variation. Then we divide individuals according to the region where they live. As regions, we consider five macro areas: Northern England, Middle England, Southern England, Scotland and Wales. For each of them we create a dummy variable. We exclude from the analysis individuals from North Ireland, for the strong segregation in marriages between catholics and between protestants in this area (Jerkins, 1997), which causes distortions in the analysis of assortative matching. Moreover, we sort individuals according to their job. We use five main job qualifications, derived by the Standard Occupational Classification 2000 (SOC 2000): professional, manager, administrative, technician and
manual. For every qualification, we create a dummy variable.

Finally, for the analysis of assortative matching and marital satisfaction, the explanatory variable is the partner’s higher education, while for the job satisfaction analysis, the explanatory variable is higher education.

4.3 Descriptive analysis

Table 2 shows the descriptive statistics of the full sample, men and women.

The mean for job satisfaction is 5.34 for the full sample, 5.21 for men and 5.47 for women. The positive job-satisfaction differential in women’s favour confirms the previous evidence (Sousa-Poza and Sousa-Poza, 2003). The mean marital satisfaction is roughly 1.89 for the full sample, 1.90 for men and 1.88 women. The average age around 41 years for men and 40 for women. The most part of couples (around 26%) are from South England and the least part comes from the Midlands (around 12%). Manual jobs are the most common for both genders, followed for men by management and for women by administrative jobs. Finally, the amount of men who acquire higher education is approximately 5% higher. This confirms the validity of the theoretical assumption that the group of educated men were larger than the group of educated women.

5 The Empirical Model

In this section we present the structure of the empirical model. We proceed as follows. First, we check the existence of the positive relationship between partners’ education. This would be consistent with the assumption of assortative matching. Second, we estimate an equation for job satisfaction and an equation for marital satisfaction, in order to verify the implications of the theoretical model.

In order to control for a positive relationship between partners’ education, we use the individual’s education as dependent variable and the partner’s education as explanatory variable. This seems the natural way to control whether assortative matching to exist\(^7\).

As control variables, we consider regions and age. The equation for check-

\(^7\)The literature on assortative matching focuses on trends in positive relationship between education level of partners along the time. Instead we just check for the existence of this relationship to prove the correctness of our assumption.
Table 2. Descriptive statistics: full sample, men and women.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Full sample</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Min/Max</td>
</tr>
<tr>
<td>Job satisfaction (not at all, completely?)</td>
<td>5.3467</td>
<td>1.2267</td>
<td>1</td>
</tr>
<tr>
<td>Marital satisfaction</td>
<td>1.8964</td>
<td>0.3939</td>
<td>0</td>
</tr>
<tr>
<td>Age</td>
<td>41.5402</td>
<td>9.9504</td>
<td>23</td>
</tr>
<tr>
<td>Regions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wales</td>
<td>0.1659</td>
<td>0.3720</td>
<td>0</td>
</tr>
<tr>
<td>Scotland</td>
<td>0.2047</td>
<td>0.4035</td>
<td>0</td>
</tr>
<tr>
<td>Southern England</td>
<td>0.2665</td>
<td>0.4421</td>
<td>0</td>
</tr>
<tr>
<td>Middle England</td>
<td>0.1257</td>
<td>0.3316</td>
<td>0</td>
</tr>
<tr>
<td>Northern England</td>
<td>0.2199</td>
<td>0.4142</td>
<td>0</td>
</tr>
<tr>
<td>Professions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manager</td>
<td>0.1614</td>
<td>0.3679</td>
<td>0</td>
</tr>
<tr>
<td>Professional</td>
<td>0.1274</td>
<td>0.3334</td>
<td>0</td>
</tr>
<tr>
<td>Technician</td>
<td>0.1519</td>
<td>0.3589</td>
<td>0</td>
</tr>
<tr>
<td>Administrative</td>
<td>0.1454</td>
<td>0.3526</td>
<td>0</td>
</tr>
<tr>
<td>Manual</td>
<td>0.4136</td>
<td>0.4925</td>
<td>0</td>
</tr>
<tr>
<td>Higher Education (Yess=1, No=0)</td>
<td>0.5912</td>
<td>0.4916</td>
<td>0</td>
</tr>
</tbody>
</table>

Observations: 10812 5406 5406

15
ing assortative matching is:

\[ uni_{it} = \gamma_1 sex_{it} + \gamma_2 age_{it} + \gamma_3 age^2_{it} + \gamma_4 regions_{it} + \gamma_5 unip_{it} + \varepsilon_{it} \] (3)

where \( i = 1, \ldots, n \) denote individuals and \( t = 1, 2, 3, 4 \) the ages considered, \( uni_{it} \) represents education (university or not), \( sex_{it}, age_{it} \) and \( age^2_{it} \) denote sex, age and age square, \( regions_{it} \) collects the control variables about regions and \( unip_{it} \) is the partner’s level of education. We perform a binary random-effects probit model (Guilkey and Murphy, 1993), which assumes unobserved heterogeneity to be constant over time.

Second, we estimate an equation for job satisfaction:

\[ jobsat_{it} = \gamma_1 sex_{it} + \gamma_2 age_{it} + \gamma_3 age^2_{it} + \gamma_4 regions_{it} + \gamma_5 professions_{it} + \gamma_6 unip_{it} + \varepsilon_{it} \] (4)

where \( jobsat_{it} \) is job satisfaction and \( professions_{it} \) is a vector of the control variables about job qualification.

Because the ordered nature of job satisfaction scores in most surveys, the typical estimation technique performed is ordered probit estimation\(^8\). Nonetheless, the panel nature of the data deny us to perform an ordered analysis\(^9\). We sidestep the issue by keeping the ordered nature of the job satisfaction scores and perform a pooled ordered probit. In this way we take into account that job satisfaction can change for same individuals, hence the panel analysis is not redundant.

Finally, we estimate an equation where we investigate the relationship between marital satisfaction and the partner’s level of education:

\[ maritalsat_{it} = \gamma_1 sex_{it} + \gamma_2 age_{it} + \gamma_3 age^2_{it} + \gamma_4 regions_{it} + \gamma_5 professions_{it} + \gamma_6 unip_{it} + \varepsilon_{it} \] (5)

where \( maritalsat_{it} \) is marital satisfaction. Like for job satisfaction, we perform a pooled ordered probit analysis.

In order to account for heteroskedasticity, we perform both analyses by using robust estimators.

\(^8\) Most studies make use of ordered probit estimation but Florit and Lladosa (2007), whose work actually criticises the use of ordered choice models and compares this analysis with a Structural Equation Model (SEM).

\(^9\) In order to have a technical link with the literature, a cross-sectional ordered probit analysis has been performed by considering years 2003, 2004, 2005, and 2006: the results are qualitative similar to the panel results. Under request, we can provide these findings.
6 Results

The results of assortative matching are given in Table 3.

<table>
<thead>
<tr>
<th>Variable (dummy variable omitted: Southern England)</th>
<th>Full Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>-0.6459***</td>
</tr>
<tr>
<td></td>
<td>(0.1970)</td>
</tr>
<tr>
<td>Age</td>
<td>0.3938***</td>
</tr>
<tr>
<td></td>
<td>(0.0711)</td>
</tr>
<tr>
<td>Age squared</td>
<td>-0.0043***</td>
</tr>
<tr>
<td></td>
<td>(0.0008)</td>
</tr>
<tr>
<td>Wales</td>
<td>-0.2774</td>
</tr>
<tr>
<td></td>
<td>(0.3002)</td>
</tr>
<tr>
<td>Middle England</td>
<td>-0.1368</td>
</tr>
<tr>
<td></td>
<td>(0.0193)</td>
</tr>
<tr>
<td>Scotland</td>
<td>0.0032</td>
</tr>
<tr>
<td></td>
<td>(0.2619)</td>
</tr>
<tr>
<td>Northern England</td>
<td>0.1268</td>
</tr>
<tr>
<td></td>
<td>(0.2532)</td>
</tr>
<tr>
<td>Partner's education</td>
<td>4.2161***</td>
</tr>
<tr>
<td></td>
<td>(0.2053)</td>
</tr>
<tr>
<td>Log-likelihood</td>
<td>-3410.1842</td>
</tr>
<tr>
<td>Walchikai</td>
<td>475.41</td>
</tr>
<tr>
<td>(Prob &gt; chi2)</td>
<td>(0.0000)</td>
</tr>
</tbody>
</table>

Notes: The dependent variable is the individual's level of education. Values of standard errors are presented in parenthesis. Significance at the 1%, 5% and 10% levels is indicated by ***, ** and * respectively.

The region omitted is “Southern England”. The relationship between ages and higher education is increasing but concave. The region of living is not relevant. Finally, there is a positive and significant relationship between the partners’ levels of education. This confirms our theoretical prediction of assortative matching.

The results for job satisfaction are presented in the first part of Table 4. The dummy variables omitted are: (i) for region, “Southern England” and (ii) for professions, “Manual”.

A negative relationship between job satisfaction and age and a positive relationship between job satisfaction and age squared emerges, giving some evidence of a U-shaped relationship. This is significant for the full sample and men but not for women. This result is in line with the previous evidence with British data (Clark, 1996).

Workers in Wales are more satisfied with their jobs, so as male workers in Middle England and Scotland. A possible explanation can be the expectations about job. In relatively poorer regions, like Wales or Scotland, there are less job opportunities and this makes the individuals’ job expectations to be lower. Also, workers are relatively more satisfied by working as managers or...
Table 4. Results
Job satisfaction: pooled ordered probit with robust estimators
Marital satisfaction: pooled ordered probit with robust estimators

<table>
<thead>
<tr>
<th>Variable</th>
<th>Full sample</th>
<th>Men</th>
<th>Women</th>
<th>Full sample</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (Male=0, Female=1)</td>
<td>0.2839***</td>
<td>n/a</td>
<td>n/a</td>
<td>-0.1401***</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Age</td>
<td>-0.0294***</td>
<td>-0.0531***</td>
<td>-0.0085</td>
<td>-0.0731***</td>
<td>-0.0676***</td>
<td>-0.0817***</td>
</tr>
<tr>
<td>Age squared</td>
<td>0.0003***</td>
<td>0.0006***</td>
<td>0.0001</td>
<td>0.0008***</td>
<td>0.0007***</td>
<td>0.0009***</td>
</tr>
<tr>
<td>Regions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wales</td>
<td>0.1253***</td>
<td>0.1991***</td>
<td>0.0554</td>
<td>0.1417***</td>
<td>0.0338***</td>
<td>-0.0227</td>
</tr>
<tr>
<td>Middle England</td>
<td>0.0428</td>
<td>0.0946**</td>
<td>-0.0634</td>
<td>0.0173</td>
<td>0.0878</td>
<td>-0.0502</td>
</tr>
<tr>
<td>Scotland</td>
<td>0.0404</td>
<td>0.1066***</td>
<td>-0.0222</td>
<td>0.1649***</td>
<td>0.2383***</td>
<td>0.0941</td>
</tr>
<tr>
<td>Northern England</td>
<td>-0.0154</td>
<td>0.0425</td>
<td>-0.0665</td>
<td>0.1128**</td>
<td>0.3042***</td>
<td>-0.0480</td>
</tr>
<tr>
<td>Professions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>0.0418</td>
<td>0.1429***</td>
<td>-0.0692</td>
<td>0.1868***</td>
<td>0.0471</td>
<td>0.3348***</td>
</tr>
<tr>
<td>Manager</td>
<td>0.0582*</td>
<td>0.1596***</td>
<td>-0.0910*</td>
<td>0.0744</td>
<td>0.0982</td>
<td>0.0407</td>
</tr>
<tr>
<td>Technician</td>
<td>0.0492</td>
<td>0.1220***</td>
<td>-0.0232</td>
<td>0.0817</td>
<td>0.0563</td>
<td>0.1170</td>
</tr>
<tr>
<td>Administrative</td>
<td>-0.0607**</td>
<td>0.0105</td>
<td>-0.1285***</td>
<td>0.0872</td>
<td>0.0485</td>
<td>0.1088**</td>
</tr>
<tr>
<td>Education</td>
<td>-0.0650***</td>
<td>-0.0325</td>
<td>-0.0921***</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Partner’s education</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.0729*</td>
<td>0.1169**</td>
<td>0.0314</td>
</tr>
<tr>
<td>Observations</td>
<td>10812</td>
<td>5406</td>
<td>5406</td>
<td>10812</td>
<td>5406</td>
<td>5406</td>
</tr>
</tbody>
</table>

Notes: The dependent variable is overall job satisfaction. Values of standard errors are presented in parenthesis. Significance at the 1%, 5% and 10% levels is indicated by ***; **; and * respectively.
technicians. Male workers are more satisfied if they do professional jobs, while female workers who work as manual are relatively more satisfied with their job compared to all the other categories. Note that, apart from working, a woman usually deals with household tasks and looks after children. A manual job generally is less stressful and hence it might help to manage better all these duties.

Educated workers, both men and women, are relatively less satisfied. This is significant for the entire sample and women, but not for men. According to our theory, the interpretation of lower job satisfaction for educated individuals is the following: given the presence of assortative matching, some individual will attend university even if he or she will obtain a negative job satisfaction. This is optimal if the expected marital satisfaction increases by attending university.

By comparing our results with the literature, we first look at contributes with British data, and then more generally contributes with other countries data. Blanchflower and Oswald (1992) use the National Children Development Study (NCDS), which also considers British data, for the 1981. The dependent variable considered here is overall job satisfaction, in particular, individuals were asked to answer to the following question: “Taking everything into consideration, how satisfied or dissatisfied are you with your job as a whole?” Unlike our results, their findings show a positive relationship between job satisfaction and higher education. Clark (1996) and Clark and Oswald (1996) use an ordered probit analysis for 1991 by using BHPS. They consider overall job satisfaction, job satisfaction for kind of job and job satisfaction by salary. Their findings are consistent to our results: higher education is negatively and significantly correlated with all three types of job satisfaction.

By considering the results with non-British data, Meng (1990) uses the Social Change in Canada Survey for 1981. His analysis consider disaggregated job satisfaction. He finds significance for a negative relationships between higher education and “payment” and “surround” (i.e., job environment), and a positive relationship between higher education and “free” and “influence”. Idson performs his analysis with the Quality of Employment Survey (QES), which considers US data, for 1977. He did not find any significant relationship between education and job satisfaction. Finally, Florit and Lladosa (2007) use the Spanish Household Survey Panel (SHPS) for 1998. He finds a positive relationship between education and job satisfaction.

The results for marital satisfaction are reported in the second part of Table
4. The dummy variables omitted are the same used for the job satisfaction analysis.

The region with lower marital satisfaction is Southern England. A possible interpretation can be the higher cost of life, in particular in London, and a more stressful lifestyle which has recoils on the couple’s life.

Any worker enjoys higher marital satisfaction compared to manual workers, even though this is significant only for professional women. The reason can be that a non-manual worker might feel professionally more accomplished. This can reflect positively in the couple’s life.

There is a positive relationship between marital satisfaction and the partners’ levels of education of the full sample, men and women, even though this is not significant for women. This result is in line with the previous evidence in the literature of marital satisfaction (some examples are Stanley et al., 2006, Hahlweg and Markman, 1988, Halford, Markman, Kline, and Stanley, 2003, Sayers, Kohn, and Heavey, 1998 Silliman, Stanley, Coffin, Markman, and Jordan, 2001).

Finally, the results for marital satisfaction are in line with the findings of the theoretical model, and thus they may explain why some individuals attend university even though they are going to obtain a negative job satisfaction.

7 Concluding remarks

This paper examined the impact of higher education in marital and job satisfaction. In a world where educational and marital decisions are strongly interrelated, the proportion of both educated men and women increases as educational assortative matching increases. This makes both marginal and average job satisfaction to fall and marital satisfaction to increase. The empirical test with the British Household Panel Survey for years 2003-2006 confirm the existence of educational assortative matching. Job satisfaction diminishes the higher the educational qualification, while marital satisfaction increases the higher the partner’s level of education, as expected by the theoretical model.

Some other informations, such as parents’ job and education, ethnic and income differences, would have added more insights to the analysis. However, the price to pay was to reduce greatly the size of the subsample caused by the lack of data along the survey. Future work could investigate whether these theoretical findings are confirmed in datasets from other countries.
References


